IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION

PUBLISH

MICROSOFT CORPORATION, APPLE COMPUTER, INC., HEWLETT-PACKARD COMPANY, and NETGEAR, INC.	§	
	§	
Plaintiff	§	**CASE NO. 6:06 CV 549**
	§	**PATENT CASE**
vs.	§	
	§	
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	§	
	§	
Defendants	§	

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	§	
	§	
Plaintiff	§	**CASE NO. 6:06 CV 550**
	§	**PATENT CASE**
vs.	§	
	§	
TOSHIBA AMERICA INFORMATION SYSTEMS, INC., NINTENDO OF AMERICA, INC., FUJITSU COMPUTER SYSTEMS CORPORATION, ASUS COMPUTER INTERNATIONAL, D-LINK SYSTEMS, INC., BELKIN CORPORATION, ACCTON TECHNOLOGY CORPORATION USA, SMC NETWORKS, INC., and 3COM CORPORATION	§	
	§	
Defendants	§	

INTEL CORPORATION and DELL INC.	§	
	§	
Plaintiff	§	
	§	
vs.	§	**CASE NO. 6:06 CV 551**
	§	**PATENT CASE**
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	§	
	§	
Defendants	§	

MARVELL SEMICONDUCTOR, et al.	§	
	§	
Plaintiffs	§	
	§	
vs.	§	**CASE NO. 6:07 CV 204**
	§	**PATENT CASE**
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	§	
	§	
Defendants	§	

MEMORANDUM OPINION AND ORDER

This Memorandum Opinion construes the disputed terms in U.S. Patent No. 5,487,069 (the "'069 Patent"). Also before the Court is Defendants'[1] Motion for Summary Judgment of Invalidity.[2] The Court **DENIES** Defendants' motion for the reasons below.

BACKGROUND

The '069 Patent relates to a wireless Local Area Network ("WLAN") wherein a plurality of wireless transceivers communicate with a plurality of wireless hub transceivers. Radio frequency

[1] The term Defendants refers to every party in the above cases other than Commonwealth Scientific & Industrial Research Organisation ("CSIRO").

[2] Defendants filed their Motion for Summary Judgment of Invalidity in the following cases: *Microsoft Corp. v. CSIRO*, Case No. 6:06cv549 (Docket No. 259); *CSIRO v. Toshiba Am. Info. Sys., Inc.*, Case No. 6:06cv550 (Docket No. 319); *Intel Corp. v. CSIRO*, Case No. 6:06cv551 (Docket No. 216); *Marvell Semiconductor, Inc. v. CSIRO*, Case No. 6:07cv204 (Docket No. 69).

wave propagation characteristics must be considered in implementing a WLAN. Radio waves can be reflected by some materials such as walls, furniture, and other indoor items, creating "multipath" where a radio signal is dispersed and arrives at the receiver from different paths. As a result, there can be multiple copies of the signal with different signal strengths. The problem that can result is called "intersymbol interference" ("ISI"), which is an overlap in arrival of the same symbol from different paths. ISI is the result of time differences between the arrivals of reflected copies of the same signal. This time difference is referred to as "delay spread." As the data transmission speed gets faster, the time duration of the transmitted symbols (symbol period) gets smaller and more susceptible to ISI. In conventional radio transmission, the symbol period is set to be longer than the delay spread. Thus, multipath places an upper limit on data transmission rate. That is, as the delay spread increases, the symbol period must get longer, which in turn means that the data transmission rate necessarily decreases.

The '069 Patent provides high data transfer rates and high reliability in wireless environments with significant multipath interferrence. The patent teaches a combination of three key techniques: parallel sub-channels (ensemble modulation) wherein the period of a sub-channel symbol is longer than a predetermined time delay of the non-direct transmission paths, data reliability enhancement through Forward Error Correction ("FEC"), and data reliability enhancement through bit interleaving.

Radio transmission of information relies upon the concept of superimposing information on, or "modulating," a carrier wave. In conventional radio transmission, the carrier is at a specific "narrowband" frequency. The receiver must be tuned to that same narrowband frequency to receive the transmission. If there are many transmissions occurring at the same time at the narrowband frequency, interference will result. In order to minimize interference, various techniques have been

developed.

One technique to avoid interference from other transmission sources is to spread the signal over a wider range of frequencies. This is referred to as "spread spectrum." A particular approach to the reduction of interference is Frequency Hopping Spread Spectrum ("FHSS"), where the signal carrier is transmitted for a short period of time ("dwell time") on one narrowband frequency and is then hopped to another narrowband frequency. A WLAN that uses FHSS to reduce interference with other devices operates on a predetermined hopping sequence that is known to the receiver and can be followed by it. The dwell time, however, must be consistent with the delay spread to avoid ISI. Thus, FHSS is a wideband modulation scheme that uses multiple carriers one at a time and avoids interference with other transmission signals in the same band by hopping over many different frequencies. During any one hop, the FHSS signal appears to be a narrowband signal.

Another technique is to use multiple carriers simultaneously rather than one at a time. This is technically not a spread spectrum because the carriers remain stationary and are not moved, but it serves the same purpose of spreading the signal power over a large band. This is known as Orthogonal Frequency Division Multiplexing ("OFDM") or Multicarrier Modulation ("MCM"). The data is broken into subparts and each subpart is simultaneously transmitted on a different carrier frequency. Again, the transmission period of each part (the sub-channel symbol period) must be consistent with the delay spread to avoid ISI. As there is simultaneous transmission of all the signal parts, the data transmission rate is higher than with FHSS.

In addition to various modulation schemes for radio frequency transmission of data, an important aspect of WLAN data transmission is the addition of data reliability enhancement afforded by using coding of the actual data prior to its conversion to a modulated transmission signal. Forward Error Correction ("FEC") coding is one type of digital signal processing that improves data

reliability by introducing a known structure into a data sequence prior to transmission. This structure allows a receiver to detect and possibly correct errors caused by corruption from the channel without requesting re-transmission of the original information. In a system that employs FEC, a digital information source sends a data sequence to an encoder. The encoder inserts redundant bits, thereby outputting a longer sequence of code output bits as a "codeword." One type of FEC is known as "convolutional coding." The incoming data is in a stream of bits. A Rate ½ convolutional encoder provides two data "di-bits" for every input bit.

Additional protection to data corruption due to adjacent burst errors is data "interleaving," which spreads data over a variable period of time. With data interleaving, data is transmitted by spacing the content of consecutive data packets. Interleaving is used in conjunction with FEC. Burst errors are distributed over many data packets and the FEC has fewer errors to correct in each packet. Data interleaving shuffles the data to reduce the error rate.

In February, 2005, Commonwealth Scientific & Industrial Research Organisation ("CSIRO") sued Buffalo Technology (USA) and Buffalo, Inc. (collectively, "Buffalo") for infringement of the '069 Patent (the "*Buffalo*" litigation). The parties disputed multiple claim terms, and the Court issued a claim construction opinion. *Commonwealth Scientific & Indus. Research Org. v. Buffalo Tech. (USA)*, Case No. 6:06cv324, 2006 WL 1233122, at * 9 (E.D. Tex. May 8, 2006) (Davis, J.) ("*Buffalo Claim Construction Opinion*"). The Court subsequently granted summary judgment on validity and infringement. *Commonwealth Scientific & Indus. Research Org. v. Buffalo Tech. (USA)*, Case No. 6:06cv324, 2006 WL 3317080, at * 15 (E.D. Tex. Nov. 13, 2006) (Davis, J.) ("*Buffalo Summary Judgment Order*").

After commencement of *Buffalo*, a flurry of litigation between CSIRO and Defendants ensued, and CSIRO alleges Defendants infringe various claims of the '069 Patent. CSIRO and

Defendants agree with the Court's construction of claim terms in *Buffalo* except for those terms the parties dispute in the instant litigation. Transcript of Claim Construction Hearing held on 6/26/2008, 14–15. The Court fully incorporates its previous claim construction opinions into this opinion.[3]

APPLICABLE LAW

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). In claim construction, courts examine the patent's intrinsic evidence to define the patented invention's scope. *See id.*; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). This intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id*. Other asserted or unasserted claims can also aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id*. Differences among the claim terms can also assist in understanding a term's meaning. *Id*. For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id*. at 1314–15.

[3] *Buffalo Claim Construction Opinion*, 2006 WL 1233122; *Buffalo Summary Judgment Order*, 2006 WL 3317080, at * 16–17.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id*. (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id*. (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id*. Also, the specification may resolve ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex, Inc.*, 299 F.3d at 1325. But, "'[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent.").

Although extrinsic evidence can be useful, it is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but

technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id*. at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition is entirely unhelpful to a court. *Id*. Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id*.

The patents in suit also contain means-plus-function limitations that require construction. Where a claim limitation is expressed in "means plus function" language and does not recite definite structure in support of its function, the limitation is subject to 35 U.S.C. § 112, ¶ 6. *Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). In relevant part, 35 U.S.C. § 112, ¶ 6 mandates that "such a claim limitation 'be construed to cover the corresponding structure . . . described in the specification and equivalents thereof.'" *Id*. (citing 35 U.S.C. § 112, ¶ 6). Accordingly, when faced with means-plus-function limitations, courts "must turn to the written description of the patent to find the structure that corresponds to the means recited in the [limitations]." *Id*.

Construing a means-plus-function limitation involves multiple inquiries. "The first step in construing [a means-plus-function] limitation is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). Once a court has determined the limitation's function, "the next step is to determine the corresponding structure disclosed in the specification and equivalents thereof." *Id*. A "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Id*. Moreover, the focus of the "corresponding structure" inquiry is not merely whether a structure is

capable of performing the recited function, but rather whether the corresponding structure is "clearly linked or associated with the [recited] function." *Id.*

CLAIM TERMS

Confined Multipath [Transmission] Environment [of Radio Frequencies]

The asserted claims contain the phrase "confined multipath [transmission] environment [of radio frequencies]." CSIRO contends this phrase limits the claims and argues "confined multipath [transmission] environment [of radio frequencies]" means "an indoor environment." Defendants contend the phrase "confined multipath [transmission] environment [of radio frequencies]" does not limit the claims.

In *Buffalo*, CSIRO and Buffalo agreed these terms were claim limitations. CSIRO argued the term meant "an indoor environment." *Buffalo Claim Construction Opinion*, 2006 WL 1233122, at *3. Buffalo argued the term meant "a defined environment with boundaries wherein direct and/or reflected paths may be taken by radio frequency from a transmitter to a receiver." *Id.* The Court adopted CSIRO's construction after a review of the specification and prosecution history to discern the term's meaning. *Id.* at *4. However, the parties in *Buffalo* did not raise the issue as to whether the "confined multipath [transmission] environment [of radio frequencies]" phrase is a claim limitation.

The "confined multipath [transmission] environment [of radio frequencies]" phrase appears in apparatus and method claims. Generally, descriptions of use do not limit apparatus claims "because the patentability of an apparatus depends on the claimed structure, not the use or purpose of that structure." *Watson & Chalin Mfg., Inc. v. Boler Co.*, 227 F. Supp. 2d 633, 639 (E.D. Tex. 2002) (Davis, J.); *see also Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is*, not what a device *does*.") (emphasis in

original)); *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997) ("It is well settled that the recitation of a new intended use for an old product does not make a claim to that old product patentable."); *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990) ("The discovery of a new property or use of a previously known composition, even when that property and use are unobvious from the prior art, can not impart patentability to claims to the known composition."); *In re Danly*, 263 F.2d 844, 848 (C.C.P.A. 1959) ("Claims drawn to an apparatus must distinguish from the prior art in terms of structure rather than function."). The general rule, however, does not preclude an applicant from employing functional language to limit an apparatus claim. *See* 35 U.S.C. § 112 ¶ 6; *Schreiber*, 128 F.3d at 1478 ("A patent applicant is free to recite features of an apparatus either structurally or functionally."); *K2 Corp. v. Saloman S.A.*, 191 F.3d 1356, 1363–64 (Fed. Cir. 1999).

To limit an apparatus claim, the functional language must result in a structural difference in the claimed apparatus. *See K2*, 191 F.3d at 1363–64 (holding "said non-rigid shoe portion being permanently affixed to said base portion at least at said toe area and said heel area for substantially preventing movement therebetween at least in a horizontal plane" was a claim limitation that required the attachment to prevent the bootie from sliding around on top of the base and that the limitation spoke to the structural requirements of the attachment); *In re Stencel*, 828 F.2d 751, 754 (Fed. Cir. 1987). Where the language does not structurally differentiate the claimed apparatus, such as language that states an intended use of the invention, the language is not limiting. *Watson*, 227 F. Supp. 2d at 638; *see also In re Hack*, 245 F.2d 246, 248 (C.C.P.A. 1957). Courts review the entire patent to determine whether a functional phrase confers a structural limitation. *See Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989)); *Ex Parte Zee*, Appeal 2007-4328, 2008 WL 552695, at *3 (B.P.A.I. Feb. 28, 2008) ("As in all matters of claim

interpretation, [determining whether a functional phrase limits the claims] requires consideration of the language in the preamble and in the body of the claim in light of the disclosure in the Specification, including the drawings, without reading any disclosed embodiment into the claims as a limitation. Thus, such terms as 'operative' and 'operatively associated' must be interpreted on this basis.") (internal citations omitted).

In this case, the disputed phrase appears in the preamble of the asserted claims as well. Courts determine whether a preamble limits a claim only after a review of the entire patent to understand what the inventors actually invented and intended the claim to encompass. *Catalina Mktg.*, 289 F.3d at 808 (quoting *Corning Glass*, 868 F.2d at 1257). While there is no litmus test to determine when a preamble limits the scope of the claims, in general a preamble limits the invention if it recites essential steps or structure, or if the preamble is "necessary to give life, meaning, and vitality" to the claim. *See Catalina Mktg.*, 289 F.3d at 808 (quoting *Pitney Bowers, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). In contrast, a preamble does not limit the claim when the claim body describes a structurally complete invention and the preamble only states a purpose or an intended use for the invention. *Catalina Mktg.*, 289 F.3d at 808 (quoting *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). Further, a preamble that describes the use, intended use, or benefits of a claimed apparatus generally does not limit the claims, as the patentability of an apparatus claim depends on the claimed structure and not the use or purpose of that structure. *Catalina Mktg.*, 289 F.3d at 809.

The specification and prosecution history may recast a preamble as a claim limitation in certain circumstances. If the specification underscores additional structure or steps as important to the invention, a preamble may limit a claim if the preamble recites the additional structure or steps. *Id.* at 808. Similarly, "clear reliance on the preamble during prosecution to distinguish the claimed

invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention." *Id.* Absent such reliance, a preamble generally does not limit the claims. *Id.*

Apparatus Claims

Claim 10 claims a wireless LAN that comprises "a plurality of mobile transceivers . . . being for data transceiving operation by radio transmissions to one of said hub receivers in a confined multipath environment." '069 Patent, col. 13:23–51. Similarly, claim 26 claims a peer-to-peer wireless LAN that comprises "a plurality of mobile transceivers for data transceiving operation by radio transmissions between ones thereof in a confined multipath environment." *Id.* at col. 14:62–col. 15:21. Claim 42 claims "[a] transceiver for operation in a confined multipath transmission environment." *Id.* at col. 16:23–41. Each claim also describes the structure of the claimed transceivers. *Id.* at col. 13:23–51, col. 14:62–col. 15:21, col. 16:23–41.

The "for [data transceiving] operation [by radio transmissions] . . . in a confined multipath [transmission] environment" term limits the claims. The term describes the operable nature of the claimed transceivers, specifically whether the transceivers are operable to communicate in a confined multipath environment with each other or with a hub transceiver. *Id.* at col. 13:23–51, col. 14:62–col. 15:21, col. 16:23–41. Thus, the claims indicate the "for [data transceiving] operation [by radio transmissions] . . . in a confined multipath [transmission] environment" language is functional and speaks to the structure of and structural relationship between the claimed transceivers. *See Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1117–19 (Fed. Cir. 2004) ("[The term 'operationally connected'] is a general descriptive term frequently used in patent drafting to reflect a functional relationship between claimed components. Generally speaking . . . , it means the claimed components must be connected in a way to perform a designated function.");

K2, 191 F.3d at 1363–64.

Further, the specification and prosecution history indicate the claimed transceivers are operable to transmit data in a confined multipath environment. The specification states the problem the '069 Patent purports to solve relates to multipath interference, which affects the ability of the transceivers to communicate across a wireless channel. *See id.* at col. 2:25–31, col. 4:33–col. 5:2, col. 5:35–59. The specification indicates a key aspect of the invention is that the transceivers that comprise the wireless LAN are operable to communicate with each other in a confined multipath environment. *See id.* at col. 2:25–col. 3:7.

The prosecution history also indicates the "for [data transceiving] operation [by radio transmissions] . . . in a confined multipath [transmission] environment" term limits the claims. In response to the Examiner's rejection under 35 U.S.C. § 103 in light of U.S. Pat. No. 4,630,314 (the "Smith Patent") and U.S. Pat. No. 5,283,780 (the "Schuchman Patent"), the applicants claimed the Smith and Schuchman Patents operate over relatively long distances and did not appear to apply to a wireless LAN that may operate in a small room, unlike the applicants' invention. CSIRO's Claim Construction Briefing, Exhibit C, at 26. The applicants stated the prior art did not disclose a wireless LAN comprised of transceivers operable to communicate with one another or a hub transceiver in a confined multipath environment. *See id.* at Exhibit C, at 26–27. In total, the specification and the prosecution history show the "for [data transceiving] operation [by radio transmissions] . . . in a confined multipath [transmission] environment" results in a structural difference in the claimed transceivers and is an essential aspect of the invention. *Computer Docking Station Corp. v. Dell, Inc.*, 519 F.3d 1366, 1375 (Fed. Cir. 2008) (holding preamble term "portable" limited the claims where the specification and the applicants' statements during prosecution emphasized the "portable" feature of the invention). Thus, the term "for [data transceiving]

operation [by radio transmissions] . . . in a confined multipath [transmission] environment," whether located in the preamble or the body of the claim, is a claim limitation.

Method Claim

Claim 68 claims "[a] method for transmitting data in a confined multipath transmission environment of radio frequencies" that comprises specific steps. *Id.* at col. 18:31–46. This phrase, which appears in the preamble, is necessary to give life, meaning, and vitality to the claim. *See Catalina Mktg.*, 289 F.3d at 808 (quoting *Pitney Bowers*, 182 F.3d at 1305); *Computer Docking Station*, 519 F.3d at1375.

As stated above, the specification states the problem the '069 Patent purports to solve relates to multipath interference, which affects a transceivers' ability to communicate across a wireless channel, and a key aspect of the invention is that the communication method transfers data in a confined multipath environment. *See id.* at col. 2:25–col. 3:7, col. 4:33–col. 5:2, col. 5:35–59. Similarly, the applicants, during prosecution, argued the Smith and Schuchman Patents operate over relatively long distances and did not appear to apply to a wireless LAN that may operate in a small room, unlike the applicants' invention. CSIRO's Claim Construction Briefing, Exhibit C, at 26. Thus, the preamble limits method claim 68.

Construction of "Confined Multipath [Transmission] Environment [of Radio Frequencies]"

Having concluded the "confined multipath [transmission] environment [of radio frequencies]" term limits the claims, the Court will resolve the parties' claim-scope dispute. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008). CSIRO argues "confined multipath [transmission] environment [of radio frequencies]" means "an indoor environment." Defendants contend the term means "an area in which surrounding surfaces contain transmitted signals and in which those signals arrive at a receiver by multiple paths."

There is no reason to depart from the Court's construction of "confined multipath [transmission] environment [of radio frequencies]" in *Buffalo*. The specification notes the inventors designed the invention to ameliorate multipath transmission problems that occur more acutely in an "office or indoor environment" and "typical rooms" than with telephone or long distance radio communications. *Buffalo Claim Construction Opinion*, 2006 WL 1233122, at *4 (citing '069 Patent, col. 4:58–59, col. 5:3–15, col. 8:38–40). Further, the prosecution history links "confined multipath [transmission] environment [of radio frequencies]" with an indoor environment. *Buffalo Claim Construction Opinion*, 2006 WL 1233122, at *4; *Buffalo Summary Judgment Order*, 2006 WL 3317080, at *7; CSIRO's Claim Construction Briefing, Exhibit C, at 26. Thus, "confined multipath [transmission] environment [of radio frequencies]" means "an indoor environment."

[Peer to Peer] Wireless LAN

The '069 Patent claims, in the preamble, a "wireless LAN" and a "peer-to-peer wireless LAN" that comprise structural elements. '069 Patent, col. 13:23–51, col. 14:6–27. The claimed "wireless LAN" comprises mobile transceivers that transmit radio transmissions to and receive radio transmissions from hub transceivers. *Id.* at col. 13:32–51. Similarly, the claimed "peer-to-peer wireless LAN" comprises mobile transceivers that transmit and receive radio transmissions between each other. *Id.* at col. 14:6–27.

The specification delineates the structures that comprise the claimed "[peer-to-peer] wireless LAN." The specification discloses a wireless LAN comprised of a plurality of hubs and mobile transceivers. '069 Patent, Fig. 4, col. 5:35–59. The specification describes the internal components of the hubs and mobile transceivers and how those components operate to allow the hubs and mobile transceivers to communicate digital data over a wireless channel. *Id.* at Figs. 5, 6, 7, 8, 9; *id.* at col. 5:60–col. 12:33. The specification does not indicate that any structures typically associated with

LANs, such as routers, switches or modems, are important to implement the claimed invention.

The claims, as originally filed, contained the "[peer-to-peer] wireless LAN" preamble phrases. CSIRO's Claim Construction Briefing, Exhibit B, at 19–20. The applicant subsequently cancelled all the claims and added claims with the "[peer-to-peer] wireless LAN" preamble phrases and the current limitations. *Id.* at Exhibit C, at 6–22. The applicants stated "[t]he present invention relates to local area networks (LANs) and, in particular, wireless LANs." *Id.* at Exhibit C, at 23. The applicants subsequently described an example of a wireless LAN arrangement where hub transceivers communicate with mobile transceivers. *Id.* at Exhibit C, at 24.

In response to the Examiner's rejection under 35 U.S.C. § 103 in light of the Smith and Schuchman Patents, the applicants distinguished their invention on multiple grounds. First, the applicants claimed the Smith and Schuchman Patents operate over relatively long distances and did not appear to apply to a wireless LAN that may operate in a small room. *Id.* at Exhibit C, at 26. Second, the applicants argued the claimed inventions in the Smith and Schuchman Patents transmit and receive data at relatively low frequencies, while the applicants' invention operated at higher frequencies. *Id.* Finally, the applicants argued the Smith and Schuchman Patents did not disclose widening the sub-channel symbol period to overcome the problems in a confined multipath environment. *Id.* at Exhibit C, at 26–27.

Nothing in the intrinsic record indicates the "wireless LAN" and "peer-to-peer wireless LAN" preambles limit the claims. The preamble is a general, short-hand descriptive term for the claimed combination. The specification discloses in detail the structures that comprise the claimed "[peer-to-peer] wireless LAN" and does not indicate the claims are structurally incomplete without an additional "[peer-to-peer] wireless LAN" limitation.

The applicants did not clearly rely on the "[peer-to-peer] wireless LAN" preamble to

distinguish the invention over the Smith and Schuchman Patents. The applicants' statements about their "[peer-to-peer] wireless LAN" invention do not have independent significance to distinguish the claimed invention from the Smith and Schuchman Patents on the basis that the claimed invention is limited to a "[peer-to-peer] wireless LAN." *Catalina Mktg.*, 289 F.3d at 808. Further, the applicants' statements during prosecution, in conjunction with the specification, do not emphasize the LAN capabilities of the claimed invention such that it would be proper to limit the claims. *See Computer Docking Station*, 519 F.3d at 1375.

The term "[peer-to-peer] wireless LAN" does not limit the claims. Thus, the Court will not construe the term. *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1371 (Fed. Cir. 2003) (stating that if the preamble does not limit claim scope "the preamble is of no significance to claim construction").

Antenna Means

Claims 10, 26, 32, 42, 48, and 68 contain the term "antenna means." CSIRO contends "antenna means" means "a means for radiating or receiving radio waves" and that the term does not fall within the ambit of 35 U.S.C. § 112 ¶ 6. Defendants contend "antenna means" is a means-plus-function limitation under 35 U.S.C. § 112 ¶ 6, that the recited function is "radiating or receiving radio waves," and that the corresponding structure is a steerable antenna disclosed in the specification.

The use of the term "means" in a claim limitation raises a rebuttable presumption that the claim limitation is a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1361 (Fed. Cir. 2000). If the claim limitation recites sufficient structure to perform the recited function, the presumption has been overcome and 35 U.S.C. § 112 ¶ 6 does not govern the claim limitation. *Id.* Similarly, 35 U.S.C. § 112 ¶ 6 does not

govern a claim limitation if the limitation does not sufficiently connect a "means" to a recited function. *York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1574 (Fed. Cir. 1996); *Wenger Mfg., Inc. v. Coating Sys., Inc.*, 239 F.3d 1225, 1236 (Fed. Cir. 2001). Courts evaluate whether a claim limitation falls within the ambit of 35 U.S.C. § 112 ¶ 6 from the perspective of one of ordinary skill in the art. *Apex Inc. v. Raritan Computer, Inc.*, 324 F.3d 1364, 1374 (Fed. Cir. 2003); *see also Phillips*, 415 F.3d at 1312–13.

The term "antenna means" is presumably a means-plus-function limitation. However, the claims do not connect the "antenna means" to a recited function. '069 Patent, col. 13:23–51 (claiming a wireless LAN that comprises mobile transceivers that comprise "antenna means coupled to transmission signal processing means and to reception signal processing means"); *id.* at col. 14:6–27 (claiming a peer-to-peer wireless LAN that comprises mobile transceivers that comprise "antenna means coupled to transmission signal processing means and to reception signal processing means"); *id.* at col. 18:31–46 (claiming a method for transmitting data that comprises "transmitting, by said antenna means, said sub-channel symbols"). Additionally, the term "antenna" connotes structure to a skilled artisan. *See id.* at col. 5:60–col. 6:22.

Thus, the term "antenna means" is not a means-plus-function limitation. "Antenna means" means "a structure for radiating or receiving radio waves."[4]

Means to Apply [a] Data Reliability Enhancement

Claims 10, 26, and 42 contain the term "means to apply [a] data reliability enhancement." The parties agree the term is a means-plus-function limitation and the claimed function is "to apply [a] data reliability enhancement to said data passed to said modulation means." The parties dispute

[4] The Court previously construed "antenna means" as "a means for radiating and receiving radio waves." *Buffalo Claim Construction Opinion*, 2006 WL 1233122, at *7. The Court's current substitution of "structure" for "means" in its construction is not a substantive change to the term's meaning and will be more understandable to a lay jury.

whether the corresponding structure includes a convolutional encoder.

CSIRO may not re-litigate its position that the corresponding structure that performs the claimed function includes structure described in the "BPSK embodiment," where a forward error correction scheme, such as Reed-Solomon or convolutional coding, encodes an incoming binary data stream.

CSIRO took the position in the *Buffalo* litigation that a corresponding structure that performs the claimed function was a forward error correction circuit described in the "BPSK embodiment." *Buffalo Claim Construction Opinion*, 2006 WL 1233122, at *9. The Court rejected CSIRO's construction and held the corresponding structure was "the Rate ½ TCM (trellis coded modulation) Encoder described in block 42 of Figure 7 and referenced in column 6:32–46." *Id.*

CSIRO subsequently moved for summary judgment on infringement. The parties disputed whether the convolutional encoder present in the accused products was the same as, or structurally equivalent to, the rate ½ TCM encoder. *Buffalo Summary Judgment Order*, 2006 WL 3317080, at * 15.

CSIRO's expert opined that a rate ½ TCM encoder is a type of a convolutional encoder. *Id.* Buffalo's expert opined that there existed substantial differences between a rate ½ TCM encoder and the convolutional encoder employed in Buffalo's products. *Id.* Absent from the discussion, however, was any reason as to why the difference between a rate ½ TCM encoder and the convolutional encoder present in Buffalo's products, particularly the TCM encoder's mapping function, was substantial in the way either encoder performed the applying a data reliability enhancement function or the result obtained from either encoder's use. *Id.* at *15–*16. Buffalo's expert also did not dispute that a convolutional encoder and a rate ½ TCM encoder performed the applying a data reliability enhancement function substantially the same way. *Id.* at *16.

The Court granted CSIRO's motion summary judgment of infringement. *Id.* at *18. Neither party in *Buffalo* appealed the construction of the "means to apply [a] data reliability enhancement" limitation.

Regional circuit law governs whether a party is collaterally estopped from litigating an issue. *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 435 F.3d 1356, 1359–60 (Fed. Cir. 2006). A party is estopped from re-litigating an issue when (1) the issue at stake in the pending litigation is the same as the issue in the initial litigation; (2) the issue was actually litigated; and (3) determination of the issue in the initial litigation was a necessary part of the judgment. *Harvey Specialty & Supply, Inc. v. Anson Flowline Equip. Inc.*, 434 F.3d 320, 323 (5th Cir. 2005). The judgment must be final to preclude re-litigation of an issue. *Id.* (quoting *J.R. Clearwater, Inc. v. Ashland Chem. Co.*, 93 F.3d 176, 179 (5th Cir. 1996)).

In *Buffalo*, CSIRO and Buffalo litigated the identical issue of whether the corresponding structure for the "means to apply [a] data reliability enhancement" included structure described on in the "BPSK embodiment," where a forward error correction scheme, such as Reed-Solomon or convolutional coding, encodes an incoming binary data stream. *Buffalo Claim Construction Opinion*, 2006 WL 1233122, at *9. Determination of the corresponding structure that performs the "applying [a] data reliability enhancement" was necessary to the finding of infringement. *Buffalo Summary Judgment Order*, 2006 WL 3317080, at *15–*16, *18. Thus, CSIRO is estopped from re-litigating the construction of the "means to apply [a] data reliability enhancement."

Even if CSIRO were permitted to re-litigate its position, the specification does not disclose as corresponding structure a convolutional encoder as part of the rate ½ TCM encoder. The function of the "means to apply [a] data reliability enhancement" is "to apply a data reliability enhancement to said data passed to said modulation means." *Buffalo Claim Construction Opinion*, 2006 WL

1233122, at *9. The specification discloses and clearly links the rate ½ TCM Encoder as the structure that performs this function. *Id.*; '069 Patent, Fig. 7, col. 6:32–46.

The specification, however, does not clearly link a convolutional encoder to the "apply a data reliability enhancement to said data passed to said modulation means" function. The portion of the specification cited by CSIRO states the incoming binary stream "is encoded using a conventional forward error correction scheme such as, but not restricted to Reed-Solomon or convolutional coding." *Id.* at col. 9:36–46. This bare statement about encoding schemes, however, does not clearly link a convolutional encoder to the recited function and does not indicate a rate ½ TCM encoder includes a convolutional encoder. Thus, the corresponding structure for the "means to apply [a] data reliability enhancement" is the rate ½ TCM (trellis coded modulation) encoder described in block 42 of Figure 7 and referenced at column 6:32–46.

Blocks

Claims 10, 26, 42, and 68 contain the term "blocks." CSIRO argues "blocks" means "a block of data having one or more bits." Defendants argue "blocks" means "two or more units of data interleaved in a single group." The parties dispute whether each interleaved block of data consists of two or more bits.

The Court addressed the parties' dispute in *Buffalo* and construed "blocks" as "a block of data having one or more bits." *Buffalo Summary Judgment Order*, 2006 WL 3317080, at *16–17. Defendants' arguments do not compel a contrary construction.

Ordinarily, a single bit may constitute a "block" of data. The claims do not deviate from the term's ordinary meaning. The "blocks of . . . data" term appears in the function of the "means . . . for interleaving blocks of said data" limitation and in the method step of "interleaving blocks of said enhancement data." '069 Patent, col. 13:22–51, col. 14:62–col. 15:21, col. 16:23–41, col. 18:31–46.

Defendants claim "blocks of . . . data" must include two or more bits, as the corresponding structure to the "means . . . for interleaving blocks of said data" is the di-bit interleaver disclosed in Figure 7. Thus, Defendants argue a construction of "blocks of . . . data" that allows the means for interleaving to interleave single bits would render these claim limitations superfluous in light of the disclosed structure, the di-bit interleaver.

Defendants' construction turns claim construction of a means-plus-function limitation on its head. "At the threshold stage of construing the language setting forth the specified function, there is no consideration of the corresponding structure." *Buffalo Summary Judgment Order*, 2006 WL 3317080, at *16. Courts evaluate corresponding structure only after construing the recited function. *Id.* Thus, "blocks" means "a block of data having one or more bits."

Significant Ones of Non-Direct Transmission Paths

Claims 10, 26, 42, and 68 contain the limitation "significant ones of non-direct transmission paths." CSIRO contends the term means "reflected transmission paths within the indoor environment with sufficient signal magnitude to impair the reception of transmitted symbols." Defendants claim the limitation is indefinite and the claims are invalid under 35 U.S.C. § 112 ¶ 2.

A claim is invalid as indefinite under 35 U.S.C. § 112 ¶ 2 if the claim fails to particularly point out and distinctly claim the subject matter that the applicant regards as the invention. The primary purpose of the definiteness requirement is to ensure public notice of the scope of the patentee's legal protection, such that interested members of the public can determine whether or not they infringe. *Halliburton Energy Servs., Inc. v. M-I, LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008); *Oakley, Inc. v. Sunglass Hut Int'l*, 316 F.3d 1331, 1340 (Fed. Cir. 2003) (quoting *All Dental Prodx, LLC v. Advantage Dental Prods., Inc.*, 309 F.3d 774, 779–80 (Fed. Cir. 2002)). Thus, the definiteness inquiry focuses on how a skilled artisan would understand the claims, and courts apply

general claim construction principles in their efforts to construe allegedly indefinite claim terms. *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1348 (Fed. Cir. 2005); *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2006).

A claim is indefinite only if the claim is "not amenable to construction" or "insolubly ambiguous." *Datamize*, 417 F.3d at 1347; *Halliburton*, 514 F.3d at 1249 ("The common thread in all of [the cases where the court concluded a claim was indefinite] is that claims were only held indefinite only where a person of ordinary skill in the art could not determine the bounds of the claim, i.e., the claims were insolubly ambiguous."). An accused infringer will prevail on an indefiniteness challenge if it "shows by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim based on the claim language, the specification, and the prosecution history, as well as her knowledge of the relevant art area." *Halliburton*, 514 F.3d at 1249–50. Courts presume issued claims are valid, and a court may only find a claim indefinite only if reasonable efforts at claim construction prove futile. *Datamize*, 417 F.3d at 1347–48. Thus, a claim term is definite if it can be given any reasonable meaning. *See id.* at 1347.

A claim term is not indefinite solely because the term presents a difficult claim construction issue. *Exxon Research & Eng'g Co. v. U.S.*, 265 F.3d 1371, 1375 (Fed. Cir. 2001). Similarly, a claim is not indefinite merely because the claim employs words of degree to define the invention or does not define the invention with mathematical precision. *BJ Servs. Co. v. Halliburton Energy Servs., Inc.*, 338 F.3d 1368, 1372 (Fed. Cir. 2003); *Oakley*, 316 F.3d at 1341–42, *Exxon*, 265 F.3d at 1377–80; *see also Andrews Corp. v. Gabriel Elecs., Inc.*, 847 F.2d 819, 821–22 (Fed. Cir. 1988). The amount of precision necessary to define a claim is a function of the claimed subject matter. *See Miles Labs., Inc. v. Shandon Inc.*, 997 F.2d 870, 875 (Fed. Cir. 1993); *Exxon*, 265 F.3d at 1378–79. Whether a claim is precise enough depends on how a skilled artisan would read the claim in light

of specification, the prosecution history, relevant extrinsic evidence, and her knowledge of the relevant art. *See Halliburton*, 514 F.3d at 1249–50; *Exxon*, 265 F.3d at 1378–79; *Phillips*, 415 F.3d at 1314–1318.

The full limitation at issue claims a "modulation means for modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths." '069 Patent, col. 13:23–51, col. 14:62–col. 15:21, col. 16:23–41; *see also id.* at col. 18:31–46 (claiming a method for transmitting data in a confined multipath transmission environment that comprises, in part, the step of "modulating said data, by modulation means of said transmission signal processing means, into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of significant ones of non-direct transmission paths"). Thus, the claims indicate the sub-channel period is longer than a predetermined period. This predetermined period is representative of the time delay of significant signals that do not travel directly between transceivers.

The specification describes the multipath problem. As a result of interference from signals that do not travel directly between transceivers, the symbol period must be long enough such that the received echoes of a first symbol do not mask the receipt of a subsequent symbol. '069 Patent, Figs. 1, 2; *id.* at col. 4:33–57. However, an increased symbol period decreases the data transmission rate. The disclosed solution to the multipath problem is to spread the transmitted data over a number of parallel sub-channels, where the symbol period for each subchannel is long enough such that symbol echoes will not mask subsequent symbols. *Id.* at col. 8:2–8. As the transceivers transmit data simultaneously over many sub-channels, this configuration reliably transmits data in a multipath

environment while maintaining a high overall data transmission rate. *Id.* at col. 8:2–8.

The specification gives a specific example on how spreading the data over multiple sub-channels solves the multipath problem. It states, "typical time delays due to multipath transmissions are of the order of 50 ns because of the dimensions of typical rooms," which is the time delay where significant multipath transmissions will no longer mask the receipt of subsequent data symbols. *Id.* at col. 8:38–40; *see id.* at col. 4:51–57. If a WLAN designer desired a bit rate of 100 megabits per second, the symbol period for a single bit data symbol would be 10 ns, which is 20% of the delay time. *Id.* at col. 8:40–42. As the symbol period would be shorter than the time delays due to multipath transmissions, it would be difficult for transceivers to communicate due to multipath interference. *See id.* at Figs. 1, 2; *id.* at col. 4:33–57.

However, if the transceivers communicate over 12 parallel sub-channels, the WLAN can obtain approximately a 100 megabits per second bit rate if each sub-channel transfers data at a 8.3 megabit per second rate. *Id.* at col. 8:43–46. If 12 bits are encoded and sent as a symbol, the symbol period is on the order of 120 ns, which is greater than the delay time due to multipath transmissions. *Id.* at col. 8:46–50. Depending on the design characteristics of the WLAN, this symbol period may or may not be sufficient. *See id.* at col. 8:48–50.

Defendants have not shown by clear and convincing evidence that the "significant ones of non-direct transmission paths," when read in the context of the '069 Patent is indefinite. In light of the specification, an artisan of ordinary skill would understand that a multipath signal is significant if it sufficiently impedes the receipt subsequent symbols. *See id.* at Figs. 2, 3; *id.* at col. 4:38–col. 5:35, 8:38–50. As a practical matter, WLANs operate with different bit-error-rate ("BER") tolerances. Defendants' Motion for Summary Judgment of Invalidity, at Rappaport Declaration ("Rappaport Declaration"), at 10, 11–12. The BER is the frequency of errors expected in a

communications system relative to the total number of received bits. *Id.* at 11. A WLAN that demands a lower BER requires a longer symbol period to ensure a sufficient amount of multipath radiation has dissipated below the noise level before transmission of a subsequent symbol. *Id.* at 12. Conversely, a system that operates with a higher BER allows a shorter symbol period. *Id.* Thus, the BER sets minimum accuracy standard for the WLAN. Other design and environmental factors affect the BER but, all else equal, a longer symbol period reduces interference from multipath transmissions and increases the BER of the communications channel. *See id.* at 12, 25; '069 Patent, col. 4:51–57.

Dr. Rappaport and Dr. Andrews agree the time delays of multipath signals that impede the ability to receive sub-channel symbols depend on a variety of factors. Rappaport Declaration, at 10–20; CSIRO's Response to Defendants' Motion for Summary Judgment of Invalidity[5], Andrews Declaration ("Andrews Declaration"), at 4–6. A skilled artisan could calculate, measure, or look-up these time delays. *Id.* at 4; Rappaport Declaration, at 21–23. The calculated or measured time delay need not be accurate; all the claims require is that the period of a sub-channel symbol be longer than a predetermined period representative of the time delay of significant mulitpath transmissions. '069 Patent, col. 13:23–51. Indeed, the specification states "typical time delays due to multipath transmissions are of the order of 50 ns because of the dimensions of typical rooms," and the specification does not specify a particular amount for a particular room. *Id.* at col. 8:38–40.

The art is such that it is impossible to determine, for every potential environment, which multipath transmissions are significant and their associative delay times with any mathematical precision, and such a precise determination is not required to save the claims. *See Exxon*, 265 F.3d

[5] CSIRO filed its response to Defendants' Motion for Summary Judgment of Invalidity in the following cases: *Microsoft Corp. v. CSIRO*, Case No. 6:06cv549 (Docket No. 268); *CSIRO v. Toshiba Am. Info. Sys., Inc.*, Case No. 6:06cv550 (Docket No. 311); *Intel Corp. v. CSIRO*, Case No. 6:06cv551 (Docket No. 221); *Marvell Semiconductor, Inc. v. CSIRO*, Case No. 6:07cv204 (Docket No. 83).

at 1378–79 (holding claim limitation "for a period sufficient" was not indefinite, as specification disclosed ranges where the period was usually and preferably sufficient, and concluding the patentee expressed the claim limitation in reasonable terms in light of the subject matter, as the period would vary in different conditions). The relevant literature identifies multiple delay spread calculations and measurements for different system designs, environments, and frequency bands. *See, e.g.*, Rappaport Declaration, Ex. 3, at 972, 975, 976; *id.* at Ex. 7, at 93; *id.* at Ex 12, at 18, 19; *id.* at Ex. 13, at 1302–05; Ex. 14, at 320–324. These values are objectively measurable and not completely dependant on a skilled artisan's subjective opinion. *See Datamize*, 417 F.3d at 1350. Ultimately, a skilled artisan would take the measured, calculated, or assumed predetermined period representative of the time delay of significant multipath transmissions and design the sub-channel symbol duration to maintain a minimum BER in near worst-case environments. Andrews Declaration, at 6.

The Institute of Electrical and Electronics Engineers ("IEEE") standards adopt such an approach. The IEEE 802.11a and 802.11g standards specify a symbol period of 4,000 ns. Andrews Declaration, at 7. This symbol period, which is two orders of magnitude longer than typical time delay of multipath transmissions in a room, is well in excess of any likely time delay of significant multipath transmissions in indoor environments. *Id.*; *see also* '069 Patent, col. 8:38–40; Rappaport Declaration, at Ex. 13, at 18, 19 (disclosing median measured root-mean-square delay spreads in rooms, office buildings, and factories between 25 ns and 105 ns). Thus, a WLAN that complies with the IEEE 802.11a or 802.11g standards could operate in many different multipath environments.

Defendants have failed to prove by clear and convincing evidence the term "significant ones of non-direct transmission paths" is indefinite. In light of the above, "significant ones of non-direct transmission paths" means "reflected transmission paths with sufficient signal magnitude to impair

the reception of transmitted symbols."

Transmission Signal Processing Means / Modulation Means for Modulating Input Data of Said Input Data Channel Into a Plurality of Sub-Channels Comprised of a Sequence of Data Symbols Such That the Period of a Sub-Channel Symbol is Longer than a Predetermined Period Representative of the Time Delay of Significant Ones of Non-Direct Transmission Paths

The parties disputed these terms only to the extent the "significant ones of non-direct transmission paths" term, which appears in the modulation means function, was indefinite. The "significant ones of non-direct transmission paths" term is not indefinite, and the Court adopts its constructions of the "transmission signal processing means" and "modulation means" terms from the *Buffalo* case.

Thus, "transmission signal processing means" does not require construction. The "modulation means" function is "modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths." *Buffalo Claim Construction Opinion*, 2006 1233122, at *7. The corresponding structure is the Complex FFT (Fast Fourier Transform) Based Modulator in block 32 of Figure 6, executing the 16 Point Complex IFFT (Inverse Fast Fourier Transform) of block 47 of Figure 7, as referenced at column 6:23-31. *Id.* at *8.

CONCLUSION

For the foregoing reasons, the Court interprets the claim language in this case in the manner set forth above and **DENIES** Defendants' Motion for Summary Judgment of Invalidity. For ease of reference, the Court's claim interpretations are set forth in a table as Appendix B. The claims with the disputed terms in bold are set forth in Appendix A.

So ORDERED and SIGNED this 14th day of August, 2008.

LEONARD DAVIS
UNITED STATES DISTRICT JUDGE

APPENDIX A

U.S. Pat. No. 5,487,069

10. A **wireless LAN** comprising:
a plurality of hub transceivers coupled together to constitute a plurality of data sources and destinations; and
a plurality of mobile transceivers each coupled to data processing means and between each said data processing means and a corresponding said transceiver data passes to be transmitted or received, said transceivers being for data transceiving operation by radio transmissions to one of said hub receivers in a **confined multipath environment**, and each transceiver comprising: **antenna means** coupled to **transmission signal processing means** and to reception signal processing means, said **transmission signal processing means** in turn coupled to a input data channel, and said reception signal processing means in turn coupled to a output data channel, each said transceiver being operable to transmit and receive data at radio frequencies, said **transmission signal processing means** comprising **modulation means for modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths**, **means to apply a data reliability enhancement to said data passed to said modulation means** and means, interposed between said **data reliability enhancement means** and said ensemble modulation means, for interleaving **blocks** of said data.

11. A **wireless LAN** as claimed in claim 10, wherein said data reliability enhancement is Forward Error Correction.

12. A **wireless LAN** as claimed in claim 11, wherein said blocks of said input data are bits.

13. A **wireless LAN** as claimed in claim 10, wherein said modulation means performs, for each said sub-channel, multi-level amplitude and/or phase modulation (mQAM).

14. A **wireless LAN** as claimed in claim 13, wherein said mQAM modulation is one of: multi-level amplitude phase shift keying (mASK), permutation modulation, binary phase shift keying (BPSK), multi-level phase shift keying (mPSK) and multi-level amplitude phase keying (mAPK).

15. A **wireless LAN** as claimed in claim 10, wherein said reception signal processing means comprises demodulation means for demodulating received symbols of said plurality of sub-channels into output data for said output data channel.

16. A **wireless LAN** as claimed in claim 10, further comprising switching means for selectively coupling said antenna means to said transmission signal processing means for transmission of data and to said reception signal processing means for reception of data.

26. A **peer-to-peer wireless LAN** comprising:
a plurality of mobile transceivers for data transceiving operation by radio transmissions between ones thereof in **a confined multipath environment**, each said transceiver being coupled to a data processing means, and between each said data processing means and a corresponding said transceiver data passes to be transmitted or received, each said transceiver comprising: **antenna means** coupled to **transmission signal processing means** and to reception signal processing means, said **transmission signal processing means** in turn coupled to an input data channel, and said reception signal processing means in turn coupled to an output data channel, each said transceiver being operable to transmit and receive data at radio frequencies, said **transmission signal processing means** comprising **modulation means for modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths**, **means to apply data reliability enhancement to said data passed to said ensemble modulation means** and means, interposed between said **data reliability enhancement means** and said ensemble modulation means, for interleaving **blocks** of said data.

27. A **peer-to-peer LAN** as claimed in claim 26, wherein said data reliability enhancement is Forward Error

Correction.

28. A **peer-to-peer LAN** as claimed in claim 27, wherein said blocks of said input data are bits.

29. A **peer-to-peer LAN** as claimed in claim 26, wherein said modulation means performs, for each said sub-channel, multi-level amplitude and/or phase modulation (mQAM).

30. A **peer-to-peer LAN** as claimed in claim 29, wherein said mQAM modulation is one of: multi-level amplitude phase shift keying (mASK), permutation modulation, binary phase shift keying (BPSK), multi-level phase shift keying (mPSK) and multi-level amplitude phase keying (mAPK).

31. A **peer-to-peer wireless LAN** as claimed in claim 26, wherein said reception signal processing means comprises demodulation means for demodulating received symbols of said plurality of sub-channels into output data for said output data channel.

32. A **peer-to-peer wireless LAN** as claimed in claim 26, further comprising switching means for selectively coupling said **antenna means** to said **transmission signal processing means** for transmission of data and to said reception signal processing means for reception of data.

42. A transceiver for operation in a **confined multipath transmission environment**, said transceiver comprising **antenna means** coupled to **transmission signal processing means** and to reception signal processing means, said **transmission signal processing means** in turn coupled to an input data channel, and said reception signal processing means in turn coupled to an output data channel, said transceiver being operable to transmit and receive data at radio frequencies, said **transmission signal processing means** comprising **modulation means for modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths**, **means to apply data reliability enhancement to said data passed to said modulation means** and means, interposed between said **data reliability enhancement means** and said **modulation means**, for interleaving **blocks** of said data.

48. A transceiver as claimed in claim 42, further comprising switching means for selectively coupling said **antenna means** to said **transmission signal processing means** for transmission of data and to said reception signal processing means for reception of data.

68. A method for transmitting data in **a confined multipath transmission environment of radio frequencies**, said data being provided by an input data channel coupled to **transmission signal processing means** in turn coupled to **antenna means**, said method comprising the steps of:
applying data reliability enhancement to said data;
interleaving **blocks** of said enhanced data;
modulating said data, by **modulation means** of said **transmission signal processing means**, into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of **significant ones of non-direct transmission paths**; and
transmitting, by said **antenna means**, said sub-channel symbols.

APPENDIX B

Ref. Nos.	Term or Phrase to be Construed (Claims)	Court's Construction
1	confined multipath [transmission] environment [of radio frequencies] (claims 10, 26, 42, 68)	an indoor environment
2	[peer-to-peer] wireless LAN (claims 10, 11, 12, 13, 14, 15, 16, 26, 27, 28, 29, 30, 31, 32)	*No construction required*
3	antenna means (claims 10, 26, 32,42, 48, 68)	a structure for radiating or receiving radio waves
4	means to apply [a] data reliability enhancement (claims 10, 26, 42)	Function: to apply a data reliability enhancement to said data passed to said modulation means Structure: the rate ½ TCM (trellis coded modulation) encoder described in block 42 of Figure 7 and referenced at column 6:32–46
5	blocks (claims 10, 26, 42, 68)	a block of data having one or more bits
6	significant ones of non-direct transmission paths (claims 10, 26, 42, 68)	reflected transmission paths with sufficient signal magnitude to impair the reception of transmitted symbols
7	transmission signal processing means (claims 10, 16, 26, 32, 42, 48, 68)	*No construction required*
8	modulation means for modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths (claims 10, 26, 42, 56, 68)	Function: modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a sub-channel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths. Structure: the Complex FFT (Fast Fourier Transform) Based Modulator in block 32 of Figure 6, executing the 16 Point Complex IFFT (Inverse Fast Fourier Transform) of block 47 of Figure 7, as referenced at column 6:23-31.